STATE OF CALIFORNIA

STATE BOARD OF EQUALIZATION
PROPERTY AND SPECIAL TAXES DEPARTMENT
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November 13, 2009

TO INTERESTED PARTIES:

GUIDELINES FOR SUBSTANTIATING ADDITIONAL OBSOLESCENCE FOR PERSONAL PROPERTY AND FIXTURES

On August 21, 2009, a draft of the *Guidelines for Substantiating Additional Obsolescence for Personal Property and Fixtures* was distributed in Letter To Assessors 2009/033, and interested parties were asked to comment on the draft. A matrix summarizing the comments received from interested parties is posted on the Board's website at www.boe.ca.gov/proptaxes/perpropfix.htm.

An interested parties meeting will be held on December 8, 2009 at the Board's headquarters in Sacramento, 450 N Street, Room 122, 9:30 a.m. to noon, to discuss proposed changes to the *Guidelines*. The matrix will serve as the agenda for the meeting. Subsequently, it is anticipated that the *Guidelines* will be discussed before the Board at a Property Tax Committee meeting.

All documents regarding this project are posted on the Board's website at www.boe.ca.gov/proptaxes/perpropfix.htm. If you plan to attend the December 8, 2009 meeting, please advise Mrs. Ladeena Ford at ladeena.ford@boe.ca.gov or at 916-445-0208.

Sincerely,

/s/ Dean R. Kinnee

Dean R. Kinnee, Chief
County-Assessed Properties Division

DK:sk
Enclosure

GUIDELINES FOR SUBSTANTIATING ADDITIONAL OBSOLESCENCE FOR PERSONAL PROPERTY AND FIXTURES

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
1			SBE Staff	**Comments:** Board staff initiated this project to draft guidelines to assist county assessors' in (1) reviewing data that may be submitted by an assessee, or (2) valuing property using a method other than application of the factors provided in AH 581. We received various comments addressing the types (and extent) of obsolescence reflected in the AH 581 percent good table. Board staff believes that these issues are outside the parameters of this project because the requested revisions are, in some cases, in conflict with information provided in various Assessors' Handbooks which are Board-adopted publications. Guidelines cannot provide guidance contrary to what is included in a Board-adopted publication. Therefore, Board staff is suggesting various edits (as identified in the matrix) in an attempt to focus on the purpose of this project.	
2			Bewley Lassleben & Miller LLP (J. DeMille)	**Comments:** Assessors' representatives often argue that there is no need to consider functional obsolescence or economic obsolescence because the SBE tables take all forms of obsolescence into consideration and that the tables consider both "normal" functional and normal economic obsolescence. It would be helpful to explain the degree of functional obsolescence and economic obsolescence that is captured by the SBE tables. Wording should be added stating that when there is a question as to the accuracy of the percent good tables that each type of depreciation should be calculated separately.	No alternative text provided for staff review. See *Guidelines*, page 2, lines 10-16. Outside the parameters of this project; see Item No. 1. See *Guidelines*, page 2, lines 10-13.
3			Intel (W. Harris)	**Comment**: In your examples, the only kind of external obsolescence that is mentioned and adjusted for is for under-utilization. There are lots of other kinds, and the guidelines should give approaches for the other types of external obsolescence as well.	No alternative text provided for staff review.
4			Intel (W. Harris)	**Comment**: For a long time, the Board used the term "external obsolescence" instead of "economic obsolescence," but the draft goes back to "economic obsolescence." Why?	Accepted—The term "external obsolescence" will be used in the *Guidelines* instead of "economic obsolescence."

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
5			Intel (W. Harris)	**Comment**: This document appears to say that reproduction cost new less depreciation is actually market value. Am I reading it wrong? If there is really no difference between reproduction cost new and replacement cost new in a particular class of property, why can't the SBE or the assessors make a definitive statement to that effect. **SBE Comment on Market Value Issue**: AH 581, Tables 1 through 6 (pages 16-21 in 2009 update), includes the following statement at the bottom of each table: "This table is intended for use in the mass appraisal of equipment and fixtures when determining value for taxation purposes. However, relevant data pertinent to the assessment of a specific property should always be reviewed and considered." Tables 7, 8, and 9 are valuation factors. Pursuant to section 401.20, the values determined by use of the valuation factors are rebuttably presumed to be the full cash value for the property.	No alternative text provided for staff review. **Market Value Issue** See SBE Comment See SBE Rewrite for Items 44 and 50. **Reproduction Cost New and Replacement Cost New Issue** See *Guidelines*, page 11, lines 8-11.
6			Lane Research Inc. (R. Lane)	**Comment**: The SBE should confirm by its own impartial analysis that in fact its index factors do provide reliable estimates of reproduction cost, rather than accept without question the practices of others. **SBE Comment**: Application of the index factors in AH 581 to a property's original cost typically results in reproduction cost new. See AH 581, page 1, first paragraph of 2009 update. [See *Guidelines*, page 11, lines 2-7.]	No alternative text provided for staff review. See SBE Comment
7			Lane Research Inc. (R. Lane)	**Comment**: The SBE should state affirmatively and precisely in what situations reproduction cost new is not equal to replacement cost new (notably in the presence of functional obsolescence or superadequacy). **SBE Rewrite**: Add to page 11, line 11: <u>Thus, there may be situations where market evidence supports the need to make adjustments to reproduction cost to account for functional obsolescence before the percent good factors can be applied when determining value for taxation purposes. Any such adjustments should be based on reasonable evidence, and appropriate adjustments should be made to arrive at replacement cost new. County assessors should consider such evidence provided by assessees when making these adjustments.</u> [Edit consistent with text in AH 581, page 1, second paragraph of 2009 update.]	No alternative text provided for staff review. See SBE Rewrite

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
8			Lane Research Inc. (R. Lane)	**Comment**: The SBE should state specific procedures for adjusting its indexes to arrive at indexes of replacement cost new, i.e., incorporating much of the functional obsolescence present in many high-tech industries. **SBE Comment**: In reference to functional obsolescence present in high-tech industries, note that pursuant to Revenue and Taxation Code section 401.20 the Board conducted studies with teams that consisted of Board staff, industry representatives, and representatives from the California Assessors' Association that resulted with valuation factors for non-production computers, semiconductor manufacturing equipment and fixtures, and biopharmaceutical industry equipment and fixtures. Additionally, interested parties may provide data to Board staff via a petition in support of changing factors contained in AH 581. [See AH 581, Chapter 8, in 2009 update.]	No alternative text provided for staff review. See SBE Comment.
9			Lane Research Inc. (R. Lane)	**Comment**: Just as an example, the SBE should take official notice of the increasing computerization and automation taking place in virtually all industries and advise that its indexes should be adjusted downwards in relationship to the amount of original cost that is devoted to digital equipment of any type.	No alternative text provided for staff review. See SBE comment for Item No. 8.
10			Lane Research Inc. (R. Lane)	**Comment**: Assessors should be required to make an affirmative statement of the amount of obsolescence they believe is present in each industry. For example, if they believe that electronic test equipment has had no technological progress in the past and will have none in the future, they should so state rather than remaining silent on the issue. **SBE Comment**: Section 401.5 requires that the Board issue to county assessors data relating to costs of property and other information to promote uniformity in appraisal practices and in assessed values throughout the state. In an effort to comply with section 401.5, the Board annually publishes AH 581.	No alternative text provided for staff review. See SBE Comment See SBE comments for Item No. 8.
11			Lane Research Inc. (R. Lane)	**Comment**: The SBE should reaffirm that market value is estimated at replacement cost new less depreciation, and that reproduction cost new less depreciation reaches market value only in the absence of technological progress. That is, the SBE indexes should not be used as-is if there has been technological progress in the property under assessment.	No alternative text provided for staff review. See SBE comment for Item No. 7.

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
12			Lane Research Inc. (R. Lane)	**Comment**: The SBE should explain the precise nature of its percent good tables. They are described in purely mathematical terms in AH 582, but the text there is misleading for assets in our modern economy. The SBE's percent good factors track the decline in remaining benefits, but only after making very significant assumptions about the property. Notably, the SBE factors are based on the assumption of constant benefits from a property throughout its lifetime. This assumption is totally true for operating property of rate-base regulated utilities (who are awarded a constant rate of return on all active property), but it is generally false for all other properties.	No alternative text provided for staff review. Outside the parameters of this project; see Item No. 1.
13			Lane Research Inc. (R. Lane)	**Comment**: The SBE should thus acknowledge that the only obsolescence captured in its percent good tables is that obsolescence that creates a premature end to service lifetime.	No alternative text provided for staff review. Outside the parameters of this project; see Item No. 1.
14			Lane Research Inc. (R. Lane)	**Comment**: The SBE should issue a more workable definition of the difference between normal and abnormal obsolescence. The present definitions are quite vague and difficult to apply practically. One very useful convention would be to state that "abnormal obsolescence" causes a reduction in benefits over the lifetime of the asset, whereas "normal obsolescence" may cause a premature end of lifetime but does not cause interim reductions in benefits. This convention would allow more people to truly understand the factors calculated by the methods of AH 582 and published in AH 581. It would also allow assessors and taxpayers to have a common basis for evaluating different types of obsolescence.	No alternative text provided for staff review. Outside the parameters of this project; see Item No. 1.
15			Lane Research Inc. (R. Lane)	**Comment**: The SBE should announce the basis of the discount rates embodied in its tables in AH 581 (before or after tax, tied to the equipment or tied to the capital structure of the owner, with or without market risk, etc.), and the SBE should explain why its choices are correct. Such a practice would avoid much of the present considerable effort by which various parties attempt to convince other parties that a particular discount rate is appropriate.	No alternative text provided for staff review. Outside the parameters of this project; see Item No. 1.
16			Lane Research Inc. (R. Lane)	**Comment**: The discount rate to be employed should relate solely to the general cost of money in the capital, adjusted for the risk of owning and operating the equipment. It should not relate to the weighted average cost of capital for any particular taxpayer (since that quantity relates heavily to the risks and capital structure of the entire taxpayer, including intellectual property and many other factors irrelevant to the appropriate discount rate for the equipment itself).	No alternative text provided for staff review. Outside the parameters of this project; see No. Item 1.

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
17			Lane Research Inc. (R. Lane)	**Comment**: A good estimate of discount rate is the finance charge component of equipment leases in the industry in question.	No alternative text provided for staff review. Outside the parameters of this project; see Item No. 1.
18			Lane Research Inc. (R. Lane)	**Comment**: The excess capital costs aspect of functional obsolescence can (and should, in general) be largely captured by appropriate (and enduring) adjustments to the cost index factor used, rather than a one-time dollar amount calculated for a specific situation.	No alternative text provided for staff review. For mass appraisal purposes, an index factor cannot be adjusted to account for the excess capital cost of functional obsolescence.
19			Lane Research Inc. (R. Lane)	**Comment**: The SBE should use consistent terminology and use the term "External Obsolescence" rather than "Economic Obsolescence." For example, in the SBE's most recent relevant text (AH 504), the entry in the glossary for "Economic Obsolescence" is just "See External Obsolescence."	No alternative text provided for staff review. Accepted—The term "external obsolescence" will be used in the guidelines instead of "economic obsolescence."
20			Lane Research Inc. (R. Lane)	**Comment**: In addition to the inutility penalty described in the proposed text, the SBE should discuss more thoroughly the loss in value caused by a forced reduction in prices. For example, a plant owner may find its product to be out of favor (or no longer competitive) and then lower its prices sufficiently to achieve demand for full production. In this case, there would be no inutility penalty because there is no underutilization. However, the net benefits (i.e., income) realized from the equipment has gone down because of the price reduction, and the market value of the property is reduced as well. The calculation in this case is similar to the one recommended for "excess operating costs" for functional obsolescence, but since it is due to external obsolescence, all parties should consider it as part of the normal appraisal process.	No alternative text provided for staff review.

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
21	3	16	Cahill Davis & O'Neall, LLP (C. Davis)	"Each appraisal approach used should be carried out independently from the others. A value indicator from the cost approach, for example, should not be forced to agree with a value indicator from the comparative sales approach. Each approach used should be completed on the basis of market data supporting that approach, and all data should be derived from the market relevant to the property being appraised." **Comment**: The quoted general statement could be easily misconstrued to mean that any alignment of value conclusion was "forced," and so no adjustment for economic obsolescence could be recognized. This text should be clarified or removed. **SBE Rewrite**: Each appraisal approach used should be carried out independently from the others~~. A value indicator from the cost approach, for example, should not be forced to agree with a value indicator from the comparative sales approach. Each approach used should be~~ and completed on the basis of market data supporting that approach, and all data should be derived from the market relevant to the property being appraised.	Accepted See SBE Rewrite
22	3	29	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentence**: The cost approach to value estimates the value of an asset or a group of assets as the original cost or historical cost of the asset (or group of assets), adjusted to account for changes in value since purchase and/or installation to reflect current replacement cost.	Not accepted Variations of the cost approach include the reproduction cost approach and the replacement cost approach.

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
23	4	13	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentences**: In general, for mass appraisal purposes, the county assessor uses historical or original cost information which results in an ~~to~~ estimate of ~~a~~ reproduction cost new or replacement cost new.[1] However, t~~T~~he replacement cost new is generally the proper starting point for developing an opinion of value using the cost approach. **SBE Rewrite**: In general, for mass appraisal purposes, the county assessor ~~uses~~ applies an index factor to historical or original cost ~~information~~ to estimate ~~a~~ reproduction cost new or replacement cost new.[1] However, ~~The~~ replacement cost new is generally the proper starting point for developing an opinion of value using the cost approach. [1]Rule 6 uses the terms *historical cost* and *original cost* synonymously—the cost of the property when new. The term *acquisition cost* is used as the cost to the current owner. For purposes of these *Guidelines*, the terms are used as defined in Rule 6.	See SBE Rewrite
24	4	25	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentence**: When a property would not or cannot be exactly duplicated, as is often the case, reproduction cost loses validity as an indicator of market value.	Accepted
25	4	30	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentence**: The replacement cost is the most meaningful approach considering the principle of substitution ~~concepts~~.	Accepted
26	5	4	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentence**: The best way may be to use the latest state-of-the-art technology and materials, or ~~may be~~ to purchase another used piece of equipment able to perform to specifications of equivalent utility.	Accepted
27	5	21	SBE Staff	**Revise Sentences:** ~~Use of~~ The indexes and percent good factors provided in AH 581 are intended for use in the mass appraisal of equipment and fixtures when determining value for taxation purposes. ~~based on the indicated remaining economic life of a property give an estimate of what the market value *should* be for a property based on a broad, but similar, "market basket."~~ In most cases, it is a practical method ~~to apply~~ for mass appraisal purposes. , ~~although it does not always reflect all types of depreciation for all types of property; additional adjustments may be necessary. Market data may also be used to develop such factors when data are available.~~	See Item No. 1.

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
28	5	23	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentence**: In most cases, it is a practical method to apply for mass appraisal purposes, although it does not always reflect all types of depreciation for all types of property; additional adjustments ~~may be~~ are necessary where functional obsolescence or economic obsolescence exists, because those types of depreciation are not reflected in the percent good factors published in AH 581. Those percent good factors reflect only normal wear and tear due to typical use and maintenance, and aging.	Not accepted See Items 1 and 27.
29	5	32	SBE Staff	**Revise Sentence**: The annual business property statement allows property owners to identify all property specific conditions that would warrant adjustment ~~beyond normal appreciation and depreciation guidelines~~.	See Item No. 1.
30	7	32	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentence**: Good maintenance will slow the process, while lack of maintenance and/or overuse will increase physical deterioration.	Accepted
31	7	33	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentence**: ~~Most~~ Much physical deterioration can be ~~corrected~~ cured.	Accepted
32	7	33	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentence**: However, the relationship between the costs involved and the economic benefit derived determines whether it is economically feasible to ~~correct~~ cure or repair physical deterioration.	Accepted
33	7	35	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentence**: An element of physical deterioration is considered *curable* when the cost to ~~correct~~ cure the deficiency is less than the resulting economic benefit.	Accepted
34	8	1	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentence**: When the cost to ~~correct~~ cure the deficiency is greater than the resulting economic benefit, the element of physical deterioration is considered *incurable*.	Accepted

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
35	8	10	Bewley Lassleben & Miller LLP (J. DeMille)	"Changing technology commonly creates functional obsolescence for machinery and equipment, and some functional obsolescence can be or should be considered normal to varying degrees (depending upon the industry and equipment type)." **Comments**: (1) It would be helpful to clearly define what constitutes "normal" functional obsolescence. (2) The sentence is vague. Is functional obsolescence considered "normal" and therefore captured in the SBE tables, or is it "normal" for the assessor to consider the existence of functional obsolescence beyond anything that exists in any tables? **SBE Rewrite**: Changing technology commonly creates functional obsolescence for machinery and equipment~~, and some functional obsolescence can be or should be considered normal to varying degrees (depending upon the industry and equipment type)~~.	See SBE Rewrite Outside the parameters of this project; see Item No. 1
36	8	17	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentence**: An element of functional obsolescence is considered *curable* when the cost to ~~correct~~ cure the deficiency is less than the resulting economic benefit.	Accepted
37	8	17	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentence**: An element of functional obsolescence is considered *curable* when the cost to correct the deficiency is less than the present value of the operating penalty associated with allowing the conditions creating the functional obsolescence to continue over the remaining life of the property ~~resulting economic benefit~~. When the cost to correct the deficiency is greater than the present value of allowing the conditions which result in functional obsolescence to continue, ~~resulting economic benefit,~~ the element of functional obsolescence is considered *incurable*.	Accepted
38	8	19	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentence**: When the cost to ~~correct~~ cure the deficiency is greater than the resulting economic benefit, the element of functional obsolescence is considered *incurable*.	Accepted

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
39	8	22	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentence**: *Economic obsolescence*, also known as external obsolescence, is a loss in value resulting from adverse factors external to the property that decrease the desirability of the property. This type of depreciation may include the loss of value due to <u>any one or a combination of the following factors</u>: **SBE Rewrite**: ~~*Economic*~~ <u>*External*</u> *obsolescence*, also known as ~~external~~ <u>economic</u> obsolescence, is a loss in value resulting from adverse factors external to the property that decrease the desirability of the property. This type of depreciation may include the loss of value due to <u>any one or a combination of the following factors</u>:	Accepted See SBE Rewrite
40	8	27	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Bullet**: Legislation <u>or regulations</u>.	Accepted
41	8	29	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Bullet**: ~~Reduced~~ <u>Inadequate</u> demand for the product <u>relative to production capacity</u>.	Accepted
42	9	1	Bewley Lassleben & Miller LLP (J. DeMille)	"Loss in value attributable to economic obsolescence is usually beyond the owner's control and is mostly atypical depreciation. It can, however, be normal in industries where markets have shown long-term sustained and predictable shifts, such as the market for semiconductor and other high-technology equipment." **Comments:** (1) What is "atypical depreciation?" (2) Once sentence states that economic obsolescence is "atypical," but the next sentence states that it may be "normal" in certain industries. It would be helpful to define what is meant by use of the word "normal." For example, is it "normal" in that the SBE tables already consider economic obsolescence, or is it "normal" for the assessor to consider the existence of economic obsolescence in those industries where there is long-term sustained and predictable shifts? **SBE Rewrite**: Loss in value attributable to ~~economic~~ <u>external</u> obsolescence is usually beyond the owner's control. ~~and is mostly atypical depreciation. It can, however, be normal in industries where markets have shown long-term sustained and predictable shifts, such as the market for semiconductor and other high-technology equipment.~~	See SBE Rewrite Outside the parameters of this project; see Item No. 1.

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
43	9	2	Cahill Davis & O'Neall, LLP (C. Davis)	**Delete Sentence**: ~~It can, however, be normal in industries where markets have shown long-term sustained and predictable shifts, such as the market for semiconductor and other high-technology equipment.~~ **Comment:** Please consider either deleting the indented text, or adding text which makes it plain that regardless of the cause – that is, whether obsolescence can be anticipated or not – the impact of obsolescence must be accounted for.	Accepted
44	10	22	SBE Staff	**Revise Sentence:** The next step is to apply a percent good factor to trended historical cost in order to ~~estimate the market value of the property,~~ calculate reproduction or replacement cost new less ~~normal~~ depreciation.	See Item No. 1.
45	11	8 26	Cahill Davis & O'Neall, LLP (C. Davis)	**Comment:** Pages 11, lines 8 – 11 and 24-26 are identical. The duplicative text should be omitted.	Accepted Duplicative text on page 11, lines 24-26 will be deleted.
46	11	9	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentence**: In industries where the equipment used is undergoing rapid changes in technology or where technology may not rapidly change but newer technology is available, further adjustments are likely to be needed to arrive at replacement cost new.	Accepted
47	11	22	SBE Staff	**Revise Sentence:** ~~High-technology equipment, for example, typically suffers greater than normal functional obsolescence due to technological progress.~~	See Item No. 1.
48	11	27	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentence**: Indications of changes in technology may include increased capacity of new equipment, changes in equipment design, material, or process, or lower operating or acquisition costs for new equipment. The effects of technological advances may include the increased capacity of new equipment, changes in equipment design, materials and processes, and lower operating or acquisition costs for new equipment. **SBE Rewrite**: Indications of changes in technology may include increased capacity of new equipment, changes in equipment design, material, or process, or lower operating or acquisition costs for new equipment. ~~The effects of technological advances may include the increased capacity of new equipment, changes in equipment design, materials and processes, and lower costs for new equipment.~~	See SBE Rewrite

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
49	11	30	Cahill Davis & O'Neall, LLP (C. Davis)	"Forces that may cause obsolescence include changes in taste in the marketplace and regulatory requirements." **Comment:** Consider aligning the last sentence in this paragraph with *The Appraisal of Real Estate, 13th Edition*. On page 44, *The Appraisal of Real Estate* lists four forces that influence real property; 1) Social forces, 2) Economic circumstances, 3) Government controls and regulations, and 4) Environmental conditions, all of which should be incorporated into the draft Guidelines.	No alternative text provided for staff review.
50	11	35	SBE Staff	**Revise Sentence**: The percent good concept is used in the appraisal process for two reasons: (1) it focuses the appraisal on the benefits remaining or the economic life remaining in the property rather than the benefits used; and (2) it saves one arithmetical operation ~~when estimating market value~~.	See Item No. 1.
51	12	11	SBE Staff	**Delete Sentences**: ~~If equipment has experienced abnormal, excessive, or even less-than-expected depreciation, the percent good factors may not be reliable. In this case, a percent good factor could be used in combination with another method of depreciation calculation, or it may be necessary to use another approach to value altogether. This is also true if the equipment is unique, if limited cost information is available, or if age or expected life estimates cannot be accurately determined. There may be instances when an appraiser should verify reproduction or replacement cost new less depreciation by other approaches before accepting a mass-appraisal indicator, such as an indicator developed from the tables in AH 581, as the best indicator.~~	See Item No. 1.
52	12	11	Bewley Lassleben & Miller LLP (J. DeMille)	"If equipment has experienced abnormal, excessive, or even less-than-expected depreciation, the percent good factors may not be reliable." **Comment:** What is "abnormal" or "excessive" depreciation?	Outside the parameters of this project; see Item No. 1.
53	12	16	Bewley Lassleben & Miller LLP (J. DeMille)	"There may be instances when an appraiser should verify reproduction or replacement cost new less depreciation by other approaches before accepting a mass-appraisal indicator, such as an indicator developed from the tables in AH 581, as the best indicator." **Comment:** It would be helpful if the text could contain an example.	See *Guidelines*, page 2, lines 10-16. No example provided for staff review.
54	12	39	Bewley Lassleben & Miller LLP (J. DeMille)	"For an example, see the Board's *Sales and Use Tax Audit Manual*, Chapter 13: *Statistical Sampling*." **Comment:** Footnote AH 504, Appendix G.	Accepted

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
55	13	1	Bewley Lassleben & Miller LLP (J. DeMille)	"Straight-Line or Age-Life Method" **Comment:** This discussion should state that if either the taxpayer or the assessor prepares a lifing study to determine economic lives, that a copy of the study must be provided for review to either the assessor or the taxpayer.	No alternative text provided for staff review. Some information in a lifing study may be considered confidential. It is up to the taxpayer and/or the county to determine what information may be released.
56	13	22	Cahill Davis & O'Neall, LLP (C. Davis)	**Add Sentences after "replacement":** Although use of an *economic life* in the age-life calculation captures some aspects of economic obsolescence by considering the impact of such factors on the expected life of the property, it does not capture any aspect of economic obsolescence that may impact the property during the term of that economic life. Care must be taken when using this method to be certain that functional and economic obsolescence that is not accounted for by the age-life relationship is separately accounted for in the valuation. **SBE Rewrite**: While an estimate of depreciation is easily achieved, the result is an approximation based on the usually faulty assumption that property depreciates on a straight-line basis throughout its economic life. Therefore, this method should be used in combination with another method or methods. [*Edit consistent with text in AH 502*, page 24.]	See SBE Rewrite
57	14	8	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentence**: The American Society of Appraisers identifies three methods of measuring physical deterioration.	Accepted
58	15	Table Very Good (VG)	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentence**: This term describes an item of equipment in excellent condition capable of being used to its fully specified utilization for its designed purpose without being modified and without requirement of any repairs or abnormal maintenance at the time of inspection or within the foreseeable future.	Accepted
59	15	7	Sacramento County Assessor (M. Conde) Cahill Davis & O'Neall, LLP (C. Davis)	**Correct Formula**: For example, if a piece of equipment is expected to be used for 50,000 hours but it is rebuilt at 50,000 hours and is expected to continue operation for additional 25,000 hours, physical deterioration using the use vs. total use method is calculated as follows: [50,000/(50,000 + 25,000)] x 100 = 67 percent.	Accepted

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
60	16	5	Sacramento County Assessor (M. Conde) Cahill Davis & O'Neall, LLP (C. Davis)	**Correct Formula:** effective age/ (effective age + remaining physical life) = percent of physical deterioration	Accepted
61	16	18	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentence**: Under the direct dollar measurement method, a portion of the ~~physical depreciation,~~ curable physical deterioration~~,~~ is estimated by determining the cost to cure the physical problem with the property. **SBE Rewrite**: Under the direct dollar measurement method, ~~a portion of the physical depreciation,~~ curable physical deterioration~~,~~ is estimated by determining the cost to cure the physical problem with the property.	See SBE Rewrite
62	16	30	Bewley Lassleben & Miller LLP (J. DeMille)	"Estimating Functional Obsolescence" **Comment:** How does the concept of "normal functional obsolescence" interact with that of "estimated functional obsolescence?" If there is such a thing as "normal functional obsolescence," how do you account for it in the context of "abnormal functional obsolescence?" Wording should be added that states that the three types of depreciation should be calculated separately when there is a question as to the accuracy of the percent good tables.	Outside the parameters of this project; see Item No. 1.
63	16	31	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentence**: When the capacity or efficiency of a property to perform the function for which it was intended declines, functional obsolescence is present.	Accepted
64	16	34	Bewley Lassleben & Miller LLP (J. DeMille)	**Revise Sentence**: Functional obsolescence is considered curable if, on the appraisal date, it is economically feasible to ~~correct~~ cure the problem; otherwise, it is incurable.	Accepted

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
65	17	20	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentences**: ~~E = Income tax on incremental income (to account for additional income using modern equipment due to less operating expenses) (D x combined federal and state income tax rate = E)~~ ~~F = Annual excess operating expense reduced by income tax on incremental income *(D – E = F)*~~ ~~G~~ E = Remaining economic life of subject property ~~H~~ F= Present value factor for annuity (~~G~~ E @ appropriate pretax discount rate that reflects a "safe" or "low-risk" investment to reflect the risk associated with a negative cash flow. This is typically not the same discount rate as used in an income approach valuation which calculates the value of a higher risk, opportunistic cash flow.) **Operating Obsolescence** = Annual excess operating expense ~~reduced by income tax on incremental income~~ x applicable present value factor for annuity (~~F~~ D x F ~~H~~)	Accepted
66	18	3	Cahill Davis & O'Neall, LLP (C. Davis)	**Add Sentences:** ...permanent. Economic obsolescence can either diminish or increase in the future. If the economic obsolescence is not permanent, the estimated duration of the obsolescence should be considered in the determination of value. Similarly, if economic obsolescence is expected to impact the property in the future due to anticipated changes in the market or other external factors, this should be considered in the determination of value. Compared… **SBE Rewrite**: permanent. External obsolescence can either diminish or increase in the future. If the external obsolescence is not permanent, the estimated duration of the obsolescence should be considered in the determination of value.	See SBE Rewrite
67	18	3	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentence**: Compared to physical deterioration and functional obsolescence, economic obsolescence ~~it~~ is the most difficult to measure. **SBE Rewrite:** Compared to physical deterioration and functional obsolescence, external obsolescence ~~it~~ is the most difficult to measure.	Accepted See SBE Rewrite
68	18	29	Los Angeles County (D. Trimmell)	**Revise Sentence:** In estimating inutility, information on the rated or design capacity ~~(expected capacity)~~ for a property may be acquired from the manufacturer of the equipment and/or it may be identified in the property's instruction/operation manual.	Accepted

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
69	18	33	Los Angeles County (D. Trimmell)	**Add Sentence:** …operation logs. A valid question can be raised regarding the proper capacity to use as the basis for determining economic obsolescence. If the expected capacity of the user differs from the rated capacity of the manufacturer, it may be valid to use the expected capacity instead of the rated or design capacity. **SBE Rewrite:** …operation logs. In addition, it may not always be appropriate to use a property's rated or design capacity as "Capacity A" for determining external obsolescence. If the expected capacity of the user differs from the rated capacity of the manufacturer, it may be valid to use the expected capacity instead of the rated or design capacity.	Accepted See SBE Rewrite
70	19	4	Cahill Davis & O'Neall, LLP (C. Davis)	**Add Sentences:** …ratios. The most common scale factors are between 0.6 and 0.7 for major process units or entire plants. These types of factors reflect the weighted average of all components of the process unit or plant versus utilizing individual factors for each specific piece of equipment and aspect of installation such as labor, engineering, offsites, etc.	Need source of this statement in order to validate.
71	19	6	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentence**: Scaling factors should be selected for ~~applicable to~~ the property in question.	Accepted
72	19	12	Cahill Davis & O'Neall, LLP (C. Davis)	**Add Sentences:** ...context. Thus, even recently purchased equipment, the price of which is used to establish RCN, may require further adjustment for inutility or other factors. Even if the newly acquired equipment is operating at expected, rated or design capacity, it may be experiencing a reduction in earnings for other reasons, and hence economic obsolescence may exist. It is important for an appraiser to consider the entire context of the acquisition and operation to make a determination concerning the presence or absence of economic obsolescence.	Not accepted As indicated in lines 9 through 12, recently purchased equipment is presumed to be acquired at market value; any additional inutility should be viewed in this context.
73	19	13	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentences**: Other ~~Various~~ methods are mentioned by the American Society of Appraisers to measure economic obsolescence.~~,~~[1] ~~but a specific~~ One of the methods is ~~provided~~ to measure economic obsolescence due to excess operating expenses caused by external factors (increasing costs of raw materials, labor, or utilities without a corresponding price increase of the product). This is analogous to the method that is ~~may also be~~ used to measure functional obsolescence due to excess operating expenses caused by internal factors. ~~Using this method,~~ ~~t~~The difference in the computation for economic	See SBE Rewrite

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
73 Cont				obsolescence and for functional obsolescence is ~~attributed to~~ the reason attributed to ~~for~~ the excess operating expenses~~.~~ (~~S~~see the discussion under estimating functional obsolescence for additional information on this method.) The presence or absence of one form of economic obsolescence does not rule out the presence of a different form. For example, a property may be fully utilized and still be subject to economic obsolescence if the earning power of the property is curtailed by external factors. Care must be taken not to double count functional and economic obsolescence, but care must also be taken to consider each aspect of obsolescence that may impact the property value. **SBE Rewrite**: Other ~~Various~~ methods are mentioned by the American Society of Appraisers to measure ~~economic~~ external obsolescence.~~,~~[1] ~~but a specific~~ One of the method~~s~~ is ~~provided~~ to measure ~~economic~~ external obsolescence due to excess operating expenses caused by external factors (increasing costs of raw materials, labor, or utilities without a corresponding price increase of the product). This is analogous to the method that is ~~may also be~~ used to measure functional obsolescence due to excess operating expenses caused by internal factors. ~~Using this method,~~ ~~t~~The difference in the computation for external obsolescence and for functional obsolescence is ~~attributed to~~ the reason attributed to ~~for~~ the excess operating expenses~~.~~ (~~S~~see the discussion under estimating functional obsolescence for additional information on this method.) The presence or absence of one form of external obsolescence does not rule out the presence of a different form. Care must be taken not to double count functional and external obsolescence, but care must also be taken to consider each aspect of obsolescence that may impact the property value. [1]American Society of Appraisers, *Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets*, pp. 101-102.	
74	20	21	Cahill Davis & O'Neall, LLP (C. Davis)	**Revise Sentences**: *Replacement cost new* is the cost to replace an existing property with a property of equivalent utility as of a particular date and is the most meaningful indicator under the principle of substitution.	Accepted

No.	Page/Line Reference		Source	Proposed Language	SBE Staff Position
75	21	1	Cahill Davis & O'Neall, LLP (C. Davis)	**Comment:** The example fails to calculate a replace cost for the current capacity of the equipment and uses a different projected utilization in the calculation of the FO as distinct from the EO, and so require correction. **Revise Example:** See **Attachment A**.	See **Attachment B** for SBE Comments and Rewrite of Example
76	23	26	Bewley Lassleben & Miller LLP (J. DeMille)	**Correct Error**: In conclusion, the estimated full cash value as of the January 1, 2009 lien date of the Model A Widget Production Equipment, which was purchased for $400,000 in 2004~~, is $345,000~~ (using the breakdown method of measuring depreciation) is $276,000.	Accepted
77	24	11	Bewley Lassleben & Miller LLP (J. DeMille)	"When reliable evidence of current replacement costs is available in a viable format, it is more appropriate to use market-indicated costs rather than trended historical costs." **Comment:** What is a viable format? **SBE Rewrite**: When reliable evidence of current replacement costs is available in a ~~viable~~ verifiable format, it is more appropriate to use market-indicated costs rather than trended historical costs."	See SBE Rewrite

Matrix Item No. 75
Cahill Davis & O'Neall, LLP (C. Davis)

Example of the Breakdown Method

Example of the Breakdown Method

The following example demonstrates application of the breakdown method to estimate full cash value of business personal property. As indicated previously, the breakdown method measures depreciation according to its separate sources: physical deterioration, functional obsolescence, and economic obsolescence.

Example

A taxpayer acquired the following Model A Widget Production Equipment for $400,000 in 2004.

Subject Property—Widget Production Equipment, Model A

- Capacity is 1,000 units per day (260,000 units per year)*
- Reproduction cost using trending is $520,000**
- Model A no longer produced
- Operating cost per year is $50,000***

* Rates capacity from manufacturer of Widget Production Equipment (Model A).

** Reproduction cost new determined using the Bureau of Labor Statistics' *Producer Price Indexes*. Series Id: WPU 107, Not Seasonally Adjusted, Group: Metals and Metal Products, Item: Fabricated Structural Metal Products, Base Date: 1982. [212.6 (2008 index)/163.4 (2004 index) = 1.30 index factor]. 2004 acquisition cost of $400,000 x 1.30 = $520,000 reproduction cost.

*** Operating cost includes cost of labor, material, overhead, etc. Cost estimate based on information received from the plant manager and the plant controller using the subject equipment.

What is the estimated full cash value as of the Model A Widget Production Equipment as of the January 1, 2009 lien date?

Step 1: Determine the replacement cost new of the equipment as of January 1, 2009. *Replacement cost new* is the cost to replace an existing property with a property of equivalent utility as of a particular date and is the most meaningful under the principle of substitution. In situations where equipment has undergone minimal changes in technology, reproduction cost and replacement cost are likely to be similar.

For purposes of this example, assume that Widget Production Equipment has undergone more than minimal changes in technology; Model A Widget Production Equipment is no longer produced and is not available for purchase as of January 1, 2009. Instead, the available replacement property with equivalent utility on January 1, 2009 is Model B Widget Production Equipment. Therefore, the appraiser identifies the following Model B Widget Production Equipment as the replacement for the subject property.

Replacement Property—Widget Production Equipment, Model B

- Model B's capacity is 1,200 units per day (312,000 units per year)+
- Replacement cost (using price guide publication) is **$550,000**
- Model B is the replacement equipment for Model A
- Operating cost per year is $30,000++

\+ Rated capacity from manufacturer of Widget Production Equipment (Model B).

++ Operating cost includes cost of labor, material, overhead, etc. Cost based on information received from the plant manager and the plant controller using the replacement equipment.

Comment: The subject asset has a capacity of 260,000 units per year while the replacement asset has a capacity of 312,000 units per year. This is a betterment that must be reflected in the Replacement Cost. One method to be considered would be a ratio the Replacement Cost down to subject capacity through the use of a Scale Factor as follows:

Subject Capacity = 260,000 units/year

Replacement Capacity = 312,000 units/year

Replacement Cost = $550,000

Using the formula in the ASA M&TS text book, the Subject's Replacement Cost for an asset of the same capacity would be as follows:

$$\text{Subject Replacement Cost} = \$550{,}000 \times (260{,}000/312{,}000)^{0.7}$$

$$= \$550{,}000 \times 0.8333^{0.7}$$

$$= \$550{,}000 \times 0.8802$$

$$= \$484{,}110$$

The $484,110 represents the cost of a new, modern replacement asset of the same capacity of the subject. Subtracting the $484,110 from the trended acquisition cost represents functional obsolescence from excess capital costs or $35,890 ($520,000 – 484,110).

Step 2: Estimate physical deterioration. *Physical deterioration* is the loss in value which may be the result of wear and tear from either use or exposure to various elements. There are various methods of measuring physical deterioration. Therefore, after reviewing the available data, the appraiser decides to use the age/life ratio. When using the age/life ratio, a percentage is calculated by dividing the age of the equipment at a point in time by the life of the equipment (effective age/physical life = physical deterioration percentage).[2]

- Effective age: In estimating the effective age of the Model A Widget Production Equipment, the appraiser interviews the plant manager and operators of the equipment. The appraiser discovers that the equipment goes through a major

[2] When using the age/life ratio for older equipment, a percentage is calculated as follows: effective age/(effective age + remaining physical life).

overhaul once a year and is considered to be in above-average condition. The appraiser estimates the effective age of the equipment to be 3 years.

- Physical life: In estimating the physical life of the Model A Widget Production Equipment, the appraiser interviews the plant manager, operators of the equipment, plant managers of other manufacturing companies that use Model A Widget Production Equipment, and the company that manufactures the equipment. The appraiser estimates the physical life of the equipment to be 20 years.

Physical deterioration—3/20 = 15%
~~$550,000 x .15 = **$82,500**~~

$484,110 x .015 = $72,617

Step 3: Calculate replacement cost new less physical deterioration.

~~Replacement cost new(Step 1)~~	~~$550,000~~
~~Physical deterioration (Step 2)~~	~~- 82,500~~
~~Replacement cost new less physical deterioration~~	~~**$467,500**~~

Replacement cost new (Step 1)	$484,110
Physical deterioration (Step 2)	- 72,617
Replacement cost new less physical deterioration	**$411,493**

Step 4: Estimate functional obsolescence. *Functional obsolescence* is the loss of value in a property caused by the design of the property itself. Two common methods of estimating functional obsolescence, if present, include analysis of excess capital costs and analysis of excess operating expenses.

- Excess capital cost: The appraiser begins with replacement cost in the appraisal; therefore, the step attributed to calculation of functional obsolescence from excess capital costs is eliminated.

- Excess operating expenses: Calculation of excess operating expenses quantifies the economic penalty of operating the equipment rather than the cost to cure. The appraiser estimates functional obsolescence due to excess operating expenses as follows:

Operating expense per unit of production for the subject property (A)	19¢ per unit*****
Operating expense per unit of production for replacement property (B)	10¢ per unit******
Difference in operating expense per unit (C) [A-B=C]	19¢ - 10¢ = 9¢ per unit
Annual excess operating expense (D) [Projected annual units of production x C=D]***	240,000 x 9¢ = $21,600
Income tax on incremental income (to account for additional income using modern equipment due	

to less operating expenses) (E)	
Combined federal and state income tax is 40% [D x 40%]	$21,600 x 40% = $8,640
Annual excess operating expense reduced by income tax on incremental income (F) [D – E = F]	$21,600 - $8,640 = $12,960
Remaining economic life of subject property (G)****	17 years
Present value factor for annuity (H) [17 years, discount rate 10%]*****	8.021553
Operating obsolescence [F x H]	$12,960 x 8.021553 = **$103,960**

* Operating cost per year $50,000/260,000 units per year.

** Operating cost per year $30,000/312,000 units per year.

*** Projected annual units of production of subject equipment based on interview with the plant manager.

**** *Remaining economic life* is the expected remaining life of the property on the appraisal date. For purposes of the subject property, the remaining economic life is 17 years (physical life – effective age).

***** The discount rate selected is for purposes of demonstrating the calculation of excess operating expenses. For information on calculation of a discount rate, see AH 502.

Step 5: Calculate replacement cost new less physical deterioration and functional obsolescence.

~~Replacement cost (Step 1)~~	~~$550,000~~
~~Physical deterioration (Step 2)~~	~~-82,500~~
~~Replacement cost less physical deterioration (Step 3)~~	~~$467,500~~
~~Less functional obsolescence from excess operating costs (Step 4)~~	~~-103,960~~
~~Replacement cost new less physical deterioration and functional obsolescence~~	~~**$363,540**~~

Replacement cost (Step 1)	$484,110
Physical deterioration (Step 2)	-72,617
Replacement cost less physical deterioration (Step 3)	$411,493
Less functional obsolescence from excess operating costs (Step 4)	-103,960
Replacement cost new less physical deterioration and functional obsolescence	**$307,533**

Step 6: Estimate economic obsolescence. *Economic obsolescence* is a loss in value resulting from adverse factors external to the property that decreases the desirability of the property. Therefore, the appraiser estimates economic obsolescence by calculating an inutility penalty[3] as follows:

Comment: Economic obsolescence was calculated in an inconsistent manner. Previously, the plant manager indicated (page 22, line 22) that the annual production was 240,000 units/year.

[3] Methodology from the American Society of Appraisers, *Valuing Machinery and Equipment; The Fundamentals of Appraising Machinery and Technical Assets*, p. 98.

The 175,000 used in this analysis is a different number. Using the 240,000, used previously, the result will be as follows:

Subject property: Capacity A	
[Rated or design capacity]	260,000 units
~~Subject property: Capacity B~~	
~~[Actual production]~~	~~175,000 units~~
Subject property: Capacity B	
[Actual production]	240,000 units
Exponent or scale factor+	.7
Inutility percent	
$[1 – (\text{Capacity B/Capacity A})^{x}] \times 100$	
~~$[1 – (175{,}000/260{,}000)^{.7}] \times 100$~~	
~~$[1 – (.673077)^{.7}] \times 100$~~	
~~$[1 – .757958] \times 100$~~	
~~$.242042 \times 100 = 24.2042\%$ (rounded to 24.2%)~~	~~24.2%~~
$[1 – (240{,}000/260{,}000)^{.7}] \times 100$	
$[1 – (.9231)^{.7}] \times 100$	
$[1 - .9455] \times 100$	
$.0545 \times 100 = 5.5\%$	5.5%

\+ The exponent or scale factor may be found in various published sources and varies depending on the type of property.

Step 7: Calculate replacement cost new less physical deterioration, functional obsolescence, and economic obsolescence (full cash value).

Comment: Multiplying the 5.5% times the $307,533 results in economic obsolescence of $16,914. Because this is a percentage deduction and percentage deductions should always be deducted prior to dollar deductions, it may be more appropriate to deduct economic obsolescence prior to making the deduction for operating obsolescence (see Page 13, Lines 33 and 34). This is also supported by the ASA M&TS textbook.

~~Replacement cost (Step 1)~~	~~$550,000~~
~~Physical deterioration (Step 2)~~	~~-82,500~~
~~Replacement cost less physical deterioration (Step 3)~~	~~$467,500~~
~~Less functional obsolescence from excess operating costs (Step 4)~~	~~-103,960~~
~~Replacement cost new less physical deterioration and functional obsolescence (Step 5)~~	~~$363,540~~
~~Less economic obsolescence (24.2%) (Step 6)~~	~~-87,977~~
~~Full cash value~~	~~$275,563~~
~~Rounded~~	~~**$276,000**~~

Replacement cost (Step 1)	$484,110
Physical deterioration (Step 2)	-72,617
Replacement cost less physical deterioration (Step 3)	$411,493
Less functional obsolescence from excess operating costs (Step 4)	-103,960
Replacement cost new less physical deterioration and functional obsolescence (Step 5)	**$307,533**
Less economic obsolescence (5.5%) (Step 6)	-16,914
Full cash value	$290,619

Comment: The primary difference between the two analyses is to reflect the fact that the replacement assets have a greater capacity than the subject (and more efficient, but that is adjusted in the FO analysis) and economic obsolescence must be calculated in a consistent manner with the prior data utilized in the FO analysis (production capacity). Again, the question arises concerning the order of deductions. Because the EO analysis results in a percentage, it would be more correct to deduct the EO penalty prior to the FO deduction. The result in the analysis would be a full case value of $284,901 ($411,493 – (5.5% x 411,493) – 103,960).

In conclusion, the estimated full cash value as of the January 1, 2009 lien date of the Model A Widget Production Equipment, which was purchased for $400,000 in 2004, ~~is $345,000~~ (using the breakdown method of measuring depreciation) is $~~276,000~~290,619.

Matrix Item No. 75
SBE Staff Comments and Rewrite

Example of the Breakdown Method

SBE Staff Comments: Accepted revision to the example, but also made a correction to Step 4.

Step 4 uses projected annual units of production and Step 6 uses actual production of the subject property. The number in staff's draft example was intended to be the same. During the drafting of the *Guidelines*, the number was changed in Step 6 but not changed in Step 4 (in error).

Cahill Davis & O'Neall, LLP (C. Davis) notes this error but makes the correction in Step 6 (see Attachment A); staff makes the correction in Step 4 (see Attachment B) to make it clear that an adjustment is necessary. For example, Attachment A uses the rated or design capacity of 260,000 units and the actual production of 240,000; Attachment B uses the rated or design capacity of 260,000 and the actual production of 175,000.

Example of the Breakdown Method

The following example demonstrates application of the breakdown method to estimate full cash value of business personal property. As indicated previously, the breakdown method measures depreciation according to its separate sources: physical deterioration, functional obsolescence, and economic obsolescence.

Example

A taxpayer acquired the following Model A Widget Production Equipment for $400,000 in 2004.

Subject Property—Widget Production Equipment, Model A

- Capacity is 1,000 units per day (260,000 units per year)*
- Reproduction cost using trending is $520,000**
- Model A no longer produced
- Operating cost per year is $50,000***

* Rates capacity from manufacturer of Widget Production Equipment (Model A).

** Reproduction cost new determined using the Bureau of Labor Statistics' *Producer Price Indexes*. Series Id: WPU 107, Not Seasonally Adjusted, Group: Metals and Metal Products, Item: Fabricated Structural Metal Products, Base Date: 1982. [212.6 (2008 index)/163.4 (2004 index) = 1.30 index factor]. 2004 acquisition cost of $400,000 x 1.30 = $520,000 reproduction cost.

*** Operating cost includes cost of labor, material, overhead, etc. Cost estimate based on information received from the plant manager and the plant controller using the subject equipment.

What is the estimated full cash value as of the Model A Widget Production Equipment as of the January 1, 2009 lien date?

Step 1: Determine the replacement cost new of the equipment as of January 1, 2009. *Replacement cost new* is the cost to replace an existing property with a property of equivalent utility as of a particular date and is the most meaningful under the principle of substitution. In situations where equipment has undergone minimal changes in technology, reproduction cost and replacement cost are likely to be similar.

For purposes of this example, assume that Widget Production Equipment has undergone more than minimal changes in technology; Model A Widget Production Equipment is no longer produced and is not available for purchase as of January 1, 2009. Instead, the available replacement property with equivalent utility on January 1, 2009 is Model B Widget Production Equipment. Therefore, the appraiser identifies the following Model B Widget Production Equipment as the replacement for the subject property.

Replacement Property—Widget Production Equipment, Model B

- Model B's capacity is 1,200 units per day (312,000 units per year)+
- Replacement cost (using price guide publication) is **$550,000**
- Model B is the replacement equipment for Model A
- Operating cost per year is $30,000++

+ Rated capacity from manufacturer of Widget Production Equipment (Model B).
++ Operating cost includes cost of labor, material, overhead, etc. Cost based on information received from the plant manager and the plant controller using the replacement equipment.

Comment: The subject asset has a capacity of 260,000 units per year while the replacement asset has a capacity of 312,000 units per year. This is a betterment that must be reflected in the Replacement Cost. One method to be considered would be a ratio the Replacement Cost down to subject capacity through the use of a Scale Factor as follows:

Subject Capacity = 260,000 units/year

Replacement Capacity = 312,000 units/year

Replacement Cost = $550,000

Using the formula in the ASA M&TS text book, the Subject's Replacement Cost for an asset of the same capacity would be as follows:

$$\text{Subject Replacement Cost} = \$550{,}000 \times (260{,}000/312{,}000)^{0.7}$$

$$= \$550{,}000 \times 0.8333^{0.7}$$

$$= \$550{,}000 \times 0.8802$$

$$= \$484{,}110$$

The $484,110 represents the cost of a new, modern replacement asset of the same capacity of the subject. Subtracting the $484,110 from the trended acquisition cost represents functional obsolescence from excess capital costs or $35,890 ($520,000 – 484,110).

Step 2: Estimate physical deterioration. *Physical deterioration* is the loss in value which may be the result of wear and tear from either use or exposure to various elements. There are various methods of measuring physical deterioration. Therefore, after reviewing the available data, the appraiser decides to use the age/life ratio. When using the age/life ratio, a percentage is calculated by dividing the age of the equipment at a point in time by the life of the equipment (effective age/physical life = physical deterioration percentage).[4]

- Effective age: In estimating the effective age of the Model A Widget Production Equipment, the appraiser interviews the plant manager and operators of the equipment. The appraiser discovers that the equipment goes through a major overhaul once a year and is considered to be in above-average condition. The appraiser estimates the effective age of the equipment to be 3 years.

- Physical life: In estimating the physical life of the Model A Widget Production Equipment, the appraiser interviews the plant manager, operators of the equipment, plant managers of other manufacturing companies that use Model A Widget

[4] When using the age/life ratio for older equipment, a percentage is calculated as follows: effective age/(effective age + remaining physical life).

Production Equipment, and the company that manufactures the equipment. The appraiser estimates the physical life of the equipment to be 20 years.

Physical deterioration—3/20 = 15%
~~$550,000 x .15 = **$82,500**~~

$484,110 x .015 = $72,617

Step 3: Calculate replacement cost new less physical deterioration.

~~Replacement cost new(Step 1)~~	~~$550,000~~
~~Physical deterioration (Step 2)~~	~~- 82,500~~
~~Replacement cost new less physical deterioration~~	~~**$467,500**~~

Replacement cost new (Step 1)	$484,110
Physical deterioration (Step 2)	- 72,617
Replacement cost new less physical deterioration	**$411,493**

Step 4: Estimate functional obsolescence. *Functional obsolescence* is the loss of value in a property caused by the design of the property itself. Two common methods of estimating functional obsolescence, if present, include analysis of excess capital costs and analysis of excess operating expenses.

- Excess capital cost: The appraiser begins with replacement cost in the appraisal; therefore, the step attributed to calculation of functional obsolescence from excess capital costs is eliminated.

- Excess operating expenses: Calculation of excess operating expenses quantifies the economic penalty of operating the equipment rather than the cost to cure. The appraiser estimates functional obsolescence due to excess operating expenses as follows:

Operating expense per unit of production for the subject property (A)	19¢ per unit*****
Operating expense per unit of production for replacement property (B)	10¢ per unit******
Difference in operating expense per unit (C) [A-B=C]	19¢ - 10¢ = 9¢ per unit
Annual excess operating expense (D) [Projected annual units of production x C=D]***	~~240,000 x 9¢ = $21,600~~ 175,000 x 9¢ = $15,750
Income tax on incremental income (to account for additional income using modern equipment due	

to less operating expenses) (E) Combined federal and state income tax is 40% [D x 40%]	~~$21,600 x 40% = $8,640~~ $15,750 x 40% = $6,300
Annual excess operating expense reduced by income tax on incremental income (F) [D – E = F]	~~$21,600 - $8,640 = $12,960~~ $15,750 - $6,300 = $9,450
Remaining economic life of subject property (G)****	17 years
Present value factor for annuity (H) [17 years, discount rate 10%]*****	8.021553
Operating obsolescence [F x H]	~~$12,960 x 8.021553 = **$103,960**~~ $9,450 x 8.021553 = **$75,804**

* Operating cost per year $50,000/260,000 units per year.

** Operating cost per year $30,000/312,000 units per year.

*** Projected annual units of production of subject equipment based on interview with the plant manager.

**** *Remaining economic life* is the expected remaining life of the property on the appraisal date. For purposes of the subject property, the remaining economic life is 17 years (physical life – effective age).

***** The discount rate selected is for purposes of demonstrating the calculation of excess operating expenses. For information on calculation of a discount rate, see AH 502.

Step 5: Calculate replacement cost new less physical deterioration and functional obsolescence.

~~Replacement cost (Step 1)~~	~~$550,000~~
~~Physical deterioration (Step 2)~~	~~-82,500~~
~~Replacement cost less physical deterioration (Step 3)~~	~~$467,500~~
~~Less functional obsolescence from excess operating costs (Step 4)~~	~~-103,960~~
~~Replacement cost new less physical deterioration and functional obsolescence~~	~~**$363,540**~~
Replacement cost (Step 1)	$484,110
Physical deterioration (Step 2)	-72,617
Replacement cost less physical deterioration (Step 3)	$411,493
Less functional obsolescence from excess operating costs (Step 4)	-75,804
Replacement cost new less physical deterioration and functional obsolescence	**$335,689**

Step 6: Estimate economic obsolescence. *Economic obsolescence* is a loss in value resulting from adverse factors external to the property that decreases the desirability of the property.

Therefore, the appraiser estimates economic obsolescence by calculating an inutility penalty[5] as follows:

Comment: Economic obsolescence was calculated in an inconsistent manner. Previously, the plant manager indicated (page 22, line 22) that the annual production was 240,000 units/year. The 175,000 used in this analysis is a different number. Using the 175,000, the result will be as follows:

Subject property: Capacity A	
[Rated or design capacity]	260,000 units
Subject property: Capacity B	
[Actual production]	175,000 units
Exponent or scale factor+	.7
Inutility percent	
$[1 – (\text{Capacity B/Capacity A})^{x}] \times 100$	
$[1 – (175{,}000/260{,}000)^{.7}] \times 100$	
$[1 – (.673077)^{.7}] \times 100$	
[1 - .757958] x 100	
.242042 x 100 = 24.2042% (rounded to 24.2%)	24.2%

\+ The exponent or scale factor may be found in various published sources and varies depending on the type of property.

Step 7: Calculate replacement cost new less physical deterioration, functional obsolescence, and economic obsolescence (full cash value).

~~Replacement cost (Step 1)~~	~~$550,000~~
~~Physical deterioration (Step 2)~~	~~-82,500~~
~~Replacement cost less physical deterioration (Step 3)~~	~~$467,500~~
~~Less functional obsolescence from excess operating costs (Step 4)~~	~~-103,960~~
~~Replacement cost new less physical deterioration and functional obsolescence (Step 5)~~	~~$363,540~~
~~Less economic obsolescence (24.2%) (Step 6)~~	~~-87,977~~
~~Full cash value~~	~~$275,563~~
~~Rounded~~	~~**$276,000**~~

Replacement cost (Step 1)	$484,110
Physical deterioration (Step 2)	-72,617
Replacement cost less physical deterioration (Step 3)	$411,493
Less functional obsolescence from excess operating costs (Step 4)	-75,804
Replacement cost new less physical deterioration and functional obsolescence (Step 5)	**$335,689**
Less economic obsolescence (24.2%) (Step 6)	-81,237
Full cash value	$254,452

[5] Methodology from the American Society of Appraisers, *Valuing Machinery and Equipment; The Fundamentals of Appraising Machinery and Technical Assets*, p. 98.

In conclusion, the estimated full cash value as of the January 1, 2009 lien date of the Model A Widget Production Equipment, which was purchased for $400,000 in 2004, ~~is $345,000~~ (using the breakdown method of measuring depreciation) is ~~$276,000~~ $252,452.